# Contract No.: EP/SP/52/06 Development of an EcoPark in Tuen Mun Area 38

# ENVIRONMENTAL MONITORING AND AUDIT MONTHLY EM&A REPORT for MARCH 2007

#### APPROVAL SHEET

DOCUMENT DATE: 31 March 2007

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Date: 2 1 MAY 2007

Date:

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\* IEC - Independent Environmental Checker

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#### **EXECUTIVE SUMMARY**

This is the ninth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled "Development of an EcoPark in Tuen Mun Area 38". (Environmental Permit No. EP-226/2005)

This report contains the results and findings of site inspection activities and EM&A works carried out by the Environmental Team (ET) of the Works Contractor as required in the contract during March 2007.

The site activities in the reporting period mainly consisted of site formation, excavation works, construction of administration building, marine front management office and drainage and sewerage and finishing works, fitting outs and building services installation for administration building and marine front management office.

Water spraying by water truck on site area was observed for dust mitigation.

Excavation work at Road F near site office was observed. The Contractor reopened the site exit at Road A where manual wheel washing was used. The site exit at Road F remained and manual wheel washing was used. As informed by the Engineer's Representative, no adverse comment to wheel washing of the Site has been received.

No substantial noise impact was noted by ET during weekly environmental site walks.

The silt curtain was fully repaired and reinstalled at discharge point on 14 March 2007.

Disposal of inert C&D material was recorded. Oil was found accumulated at the bottom of cabinets in Oil Storage Area. The Contractor has removed oil from cabinets.

Three empty oil containers placed beside Chemical Waste Storage Area were not properly stored in the designated contained area. The Contractor rectified by properly storing these containers in the designated contained area.

Landfill gas monitoring was carried out at site; oxygen measurement results on 08, 14

and 21 March 2007 exceeded Action and Limit Levels in accordance with the EM&A Manual. The Contractor was reminded to carry out the actions suggested in the EM&A Manual correspondingly for mitigation measure and to check and calibrate the instrument as soon as possible.

There were no notifications of summons or successful prosecution during March 2007.

The planned activities for April 2007 and May 2007 with regard to development of EcoPark consist of:

- 1) Excavation Works, Site Formation Works and Roadworks
- 2) Construction of Drainage, Sewerage and Watermain
- 3) Construction of Administration Building
- 4) Construction of Marine Front Management Office
- 5) Finishing Works, Fitting Outs and Building Services Installation for Administration Building and Marine Front Management Office

#### 1. BASIC PROJECT INFORMATION

#### 1.1 Introduction

This is the ninth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled "Development of an EcoPark in Tuen Mun Area 38". The site layout plan is shown in Appendix 1. The report was prepared by the Environmental Team, Environmental Pioneers & Solutions Limited, of the Works Contractor, Kaden Construction Limited. The report is to be submitted to the Works Contractor, the Engineer and the Environmental Protection Department for the project.

This report presents the results of the environmental monitoring of the project activities conducted during the month of March 2007. This included regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the EM&A Manual and the Contractor's Environmental Management Plan (EMP).

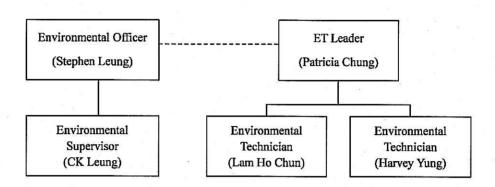
Phase 1 of the construction works has already commenced in July 2006 and is anticipated to complete in June 2007.

The contact person and telephone number of key personnel for the captioned project are shown in Appendix 2.

#### 1.2 Project Organization and Management

The Works Contractor has commissioned Environmental Pioneers & Solutions Limited as the Environmental Team, which comprises the environmental team leader and the environmental technicians to undertake the environmental monitoring and audit work for this project. The project Organization Chart of Environmental Team is shown in Figure 1.1.

Figure 1.1 Organization Chart of Environmental Team



#### 2. SUMMARY OF WORK ACTIVITIES AND CONSTRUCTION STATUS

#### 2.1 Works Undertaken during the Month

A summary of the site installation works in this month, with the information of locations, activities, equipment/materials and dates of occurrence, is provided by the Contractor, as shown in Table 2.1.

Table	2.1 Work Activities for March 2007	
Item	Work Activities & Location	Date of Occurrence
1	Site Formation Works, Excavation Works & Roadworks	1 March 2007 – 31 March 2007
2	Construction of Administration Building and Marine Front Management Office	1 March 2007 – 31 March 2007
3	Construction of Drainage, Sewerage & Watermain	1 March 2007 – 31 March 2007
4	Finishing Works, Fitting Outs & Building Services Installation for Administration Building & Marine Front Management Office	1 March 2007 – 31 March 2007

	Machineries	in the second se
21	Equipment/ Plant	Quantity
1	Mobile Crane	2
2	Excavator	14
3	Generator	4
4	Air Compressor	2
5	Roller	4
6	Loader	1
7	Grab Lorry	1
8	Crane Lorry	2
9	Water Truck	1
10	Dump Truck	2

Remarks:

- As informed by the Contractor, most equipment are mobile at site subject to work progress.

- Refer to Appendix 1 – Site layout plan for location of construction activities.

#### 2.2 Future Key Issues

The Contractor has provided an updated construction program in Table 2.2 to show the planned activities for the coming three months (April 2007 – June 2007). The anticipated environmental issues are summarized as follow:

Table	2.2 Construction Program a	and Anticipated Environmental Issues
Item	Works	Anticipated Environmental Issues
1	Site Formation Works, Excavation Works & Roadworks	<ul> <li>Generation of C&amp;D Waste; excavated material should be reused as much as practicable</li> <li>Dust may be generated; the wheel washing machine should be in operation</li> <li>Haul road should be sprayed regularly, by truck or sprinkler</li> <li>Stagnant water should be removed</li> <li>Mosquito mitigation measures should be implemented</li> </ul>
2	Construction of Administration Building & Marine Front Management Office	- Generation of waste from packaging materials and C&D wastes
3	Construction of Drainage, Sewerage & Watermain	<ul> <li>Generation of C&amp;D Waste; excavated material should be reused as much as practicable</li> <li>Dust may be generated; the wheel washing machine should be in operation</li> </ul>
4	Finishing Works, Fitting Outs & Building Services Installation for Administration Building & Marine Front Management Office	- Generation of waste from packaging materials and C&D wastes

The site inspection schedule for the next month (April 2007) is designated on 4, 11, 17 and 24 April 2007.

#### 3. STATUS OF ENVIRONMENTAL PROTECTION AND SITE INSPECTIONS

#### 3.1 Environmental Site Inspections

Environmental site inspections are required to inspect the construction activities of the Development of EcoPark in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented.

Site inspections were conducted on 8, 14, 21 and 28 March 2007.

A detailed checklist of each site inspection together with comments, relevant photos and maps have been filed and kept.

The findings and results of site inspections are provided in Table 3.1:

Table 3.1	Summary of Site Inspec	etions	10 10 10 10 10 10 10 10 10 10 10 10 10 1	
Date	Observations	Advice from ET	Outcome	Closing Date
08 Mar 07	Damage of silt curtain was observed.	To repair and maintain silt curtain properly in order to prevent muddy discharge at sea	Silt curtain was fully repaired and reinstalled at discharge point	14 Mar 07
21 Mar 07 28 Mar 07	FMH1012932 was discharged with soak-away method and no water was discharged at manhole		<del></del>	
21 Mar 07	bottom of cabinets in oil storage area	To regularly remove oil from cabinets in order to prevent spillage	Oil was removed from cabinets in oil storage area	28 Mar 07
28 Mar 07	Three empty oil containers placed beside chemical waste storage area were not stored in the designated contained area	To properly store the containers in the designated contained area in order to prevent oil spillage on the ground	All empty oil containers were properly stored in the designated contained area	14 Mar 07

#### 3.2 Air Dust

Water spraying by water truck on site area such as Road A and unpaved site area beside marine front was observed for dust mitigation.

Excavation work at Road F near site office was observed. The Contractor reopened the site exit at Road A where manual wheel washing was used. The site exit at Road F remained and manual wheel washing was used. As informed by the Engineer's Representative, no adverse comment to wheel washing of the Site has been received. The Contractor was advised to relocate the wheel washing facility at a suitable location as an effective mitigation measure and specified in PS Clause 1.16A.

#### 3.3 Noise

The major noise source was vehicle movement, machinery and rock excavation in the EcoPark. Since the nearby NSRs were remote, the noise impact was minimal. There was no specific observation noted regarding noise issue. The Construction Noise Permit was issued to the Contractor on 02 March 2007.

#### 3.4 Surface Water Quality

Underground water accumulated in the trench FMH49 – FMH1012932 was passed to sedimentation tank and then discharged at the manhole on 08 March 2007. The usage of soak-away method to discharge underground water was observed on 14, 21 and 28 March 2007 and no water was discharged at the manhole.

Damage of silt curtain installed at the discharge point at Marine Front was observed on 08 March 2007. The silt curtain was fully repaired and reinstalled at discharge point on 14 March 2007 and no muddy water was observed at discharge point.

Chemical toilets (5 nos.) have been provided by a licensed contractor, of which sewage generated is collected every three to five days without causing contamination on surface water. The Effluent Discharge Licence was issued to the Contractor on 20 November 2006.

In March 2007, water sampling and analysis of Chemical Oxygen Demand (COD) was carried out to confirm that dewatering discharge to stormwater drains meets the WPCO-TM Standard. Result is summarized in Table 3.2.

Table 3.2 Summary of COD Analysis in March	1 2007		1 1 2 1 1 2 1 1 2 1 1 2 1 1 1 2 1 1 1 2 1 1 1 1 2 1
Sampling Location	Sampling Date	Chemical Oxygen Demand (COD) (mg O <sub>2</sub> /L)	WPCO-TM Standard COD (mg O <sub>2</sub> /L)
The Manhole near the Trench FMH49 – FMH1012932	08 Mar 07	240	80

The result of COD analysis on 08 March 2007 exceeds the WPCO-TM Standard. The Contractor has been reminded and has taken immediate action to discharge the accumulated underground water into existing ground by using soak away method.

#### 3.5 Visual and Landscape Impact

Hoarding was erected at the site egress and aligned along the site boundary along Lung Mun Road. Hoardings were specially designed to be movable for future re-use in other locations.

During site clearance, trees are relocated to be replanted for landscaping in the future in EcoPark.

#### 3.6 Waste / Chemical Waste

Oil was found accumulated at the bottom of cabinets in Oil Storage Area. The Contractor rectified by removing oil from cabinets in Oil Storage Area. The Contractor was reminded to regularly remove oil in order to prevent spillage.

Three empty oil containers placed beside Chemical Waste Storage Area were not stored in the designated contained area. The Contractor rectified by properly storing these containers in the designated contained area.

The Contractor implemented visual inspection and distributed flyers/ notices to ensure all dump trucks have mechanical covers closed when leaving EcoPark site.

Separate waste collection bins were made available for collecting aluminum cans, waste paper and plastic bottles etc. The Contractor has provided the site layout plan for refuse collection points as shown in Appendix 3.

Two waste dumpers were used for the collection and storage of general waste. Temporary storage areas for waste metals and waste tyres were established.

The Contractor has provided sufficient drip trays for all (4 nos.) temporary electricity generators at site. These drip trays should be covered by tarpaulin sheet to minimize rainfall accumulation.

Excavated materials are reused as back-fill material to balance cut and fill and hence reduce the generation of materials. Surplus materials are returned to stock in centralized area with suitable protective measures. The Contractor was reminded to comply with the requirements and conditions for disposal at public fill facility and all oversized aggregates should be crushed to less than 250mm before delivering to the public fill.

Materials are recycled and re-used at site as much as practicable to minimize waste generation. Timbers are recycled to make temporary tools and assess ladders etc. Excavated rocks, concrete and asphalts are stored for future re-use in land formation and structural construction etc.

Registered waste collectors will be arranged to collect and transport the wastes whenever necessary.

Table 3.4 provides a summary table of waste disposal in March 2007. The Contractor has been reminded to keep good record at site in order to have a clear presentation of waste disposal.

Table 3.4 Summary of	Waste Disposal in M	arch 2007	
Type of Waste	Disposal Site	Quantity	Remarks
General Waste	WENT Landfill	30.0 tonnes	-
Inert C&D Material	Public Fill Facility	3186.2 tonnes	-

#### 3.7 Landfill Gas

Landfill gas (LFG) monitoring was carried out on site at six (6) locations on 08, 14 and 21 March 2007, as instructed by the Engineer's Representative. LFG measurements are summarized in Table 3.5, and original field measurement sheets with measurement locations are appended in Appendix 4. Oxygen measurement results on 08, 14 and 21 March 2007 exceeded Action and Limit Levels in accordance with the EM&A Manual, as shown in Table 3.6. The Contractor was reminded to conduct the actions suggested in the EM&A Manual correspondingly for mitigation measure and to check and calibrate the instrument as soon as possible.

Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH <sub>4</sub> ) %LEL	Carbon Dioxide (CO <sub>2</sub> ) %LEL	Oxygen (O <sub>2</sub> )
Point A	08 Mar 07	1652	Cloudy	0.0%	0.0%	18.3%
Point B1	08 Mar 07	1700	Cloudy	0.0%	0.0%	18.6%
Point B2	08 Mar 07	1657	Cloudy	0.0%	0.0%	18.4%
Point C1	08 Mar 07	1702	Cloudy	0.0%	0.0%	18.5%
Point D	08 Mar 07	1706	Cloudy	0.0%	0.0%	18.5%
Point E			Not.	Accessible		2) 2)
Point A	14 Mar 07	1601	Cloudy	0.0%	0.0%	17.9%
Point B1	14 Mar 07	1550	Cloudy	0.0%	0.0%	18.0%
Point B2	14 Mar 07	1547	Cloudy	0.0%	0.0%	18.0%
Point C1	14 Mar 07	1552	Cloudy	0.0%	0.0%	18.0%
Point D	14 Mar 07	1556	Cloudy	0.0%	0.0%	18.0%
Point E	14 Mar 07	1545	Cloudy	0.0%	0.0%	18.0%
Point A	21 Mar 07	1454	Cloudy	0.0%	0.0%	18.7%
Point B1	21 Mar 07	1508	Cloudy	0.0%	0.0%	18.5%
Point B2	21 Mar 07	1502	Cloudy	0.0%	0.0%	18.6%
Point C1	21 Mar 07	1511	Cloudy	0.0%	0.0%	18.5%
Point D	21 Mar 07	1517	Cloudy	0.0%	0.0%	18.5%
Point E	21 Mar 07	1458	Cloudy	0.0%	0.0%	18.6%

#### Remarks:

As informed by the Contractor, the LFG measurement instrument was under calibration and therefore no LFG measurement was recorded on 28 Mar 2007.

Parameter	Level	Action
Oxygen	Action Level < 19% O <sub>2</sub>	Ventilate trench/void to restore O <sub>2</sub> to > 19%
	Limit Level < 18% O <sub>2</sub>	Stop works
		Evacuate personnel/prohibit entry
		Increase ventilation to restore $O_2$ to > 19%
Methane	Action Level >10% LEL	Post "No Smoking" signs
(CH <sub>4</sub> )		Prohibit hot works
		Increase ventilation to restore CH <sub>4</sub> to <10%
	a	LEL
	Limit Level >20% LEL	Stop works
		Evacuate personnel/prohibit entry
		Increase ventilation to restore CH <sub>4</sub> to <10%
		LEL
Carbon	Action Level >0.5% CO <sub>2</sub>	Ventilate to restore CO <sub>2</sub> to < 0.5%
Dioxide	Section 1	9 9
$(CO_2)$	Limit Level >1.5% CO <sub>2</sub>	Stop works
	w 1	Evacuate personnel/prohibit entry
		Increase ventilation to restore $CO_2$ to $< 0.5\%$

#### 4. SUMMARY OF ENVIRONMENTAL PERMIT AND LICENCES

ET has checked with the Contractor for the status of all environmental permits and licenses for this project as at March 2007, which is summarized in Table 4.1. ET will follow the application process of the outstanding permits / licenses and will provide suitable assistance whenever appropriate.

Description	License / Permit No.#	Date of Issue	Date of Expiry	Status/Remarks
<b>Environmental Permit</b>	EP-226/2005	9-Sept-2005		Issued
Registration of Waste Producer	5111-421-K2869-02	27-Jul-2006		Issued
Construction Noise Permit	GW-RW0080-07	02-Mar-2007	28-Aug-2007	Issued
Effluent Discharge Licence	EP760/421/011762/I	20-Nov-2006	1-Dec-2011	Issued

#### 5. CUMULATIVE LOG OF COMPLAINTS AND REMEDIAL ACTION

The cumulative log of complaints is referred in Appendix 5.

### 6. CUMULATIVE LOG OF NOTIFICATION OF SUMMONS AND PROSECUTIONS

No notification of summons and no prosecutions occurred during March 2007.

#### 7. CONCLUSION

There is no summon nor prosecutions reported during March 2007.

Water spraying by water truck on site area was observed for dust mitigation.

Excavation work at Road F near site office was observed. The site exit at Road F remained and manual wheel washing was used. The Contractor reopened the site exit at Road A where manual wheel washing was used. As informed by the Engineer's Representative, no adverse comment to wheel washing of the Site has been received. The Contractor was advised to relocate the wheel washing facility at a suitable location as an effective mitigation measure and specified in PS Clause 1.16A.

Soak-away method were utilized to discharge underground water accumulated in the trench FMH49 – FMH1012932.

One water sample was taken by the ET at the discharge manhole, and COD test result was not in compliance with WPCO-TM Standard.

Damage of silt curtain was observed on 08 March 2007. The silt curtain was fully repaired and reinstalled at discharge point on 14 March 2007.

Daily landfill gas monitoring was carried out by the Contractor on site and some results of oxygen measurement exceeded Action and Limit levels in accordance with EM&A Manual. The Contractor was reminded to conduct the actions suggested in the EM&A Manual correspondingly for mitigation measure. The LFG measurement instrument was checked and calibrated during the reporting month, and alternative instrument were used as supplied by the Contractor.

The Contractor has been using the waste management and record system including allocation of waste storage areas and the trip ticket system as proposed in the

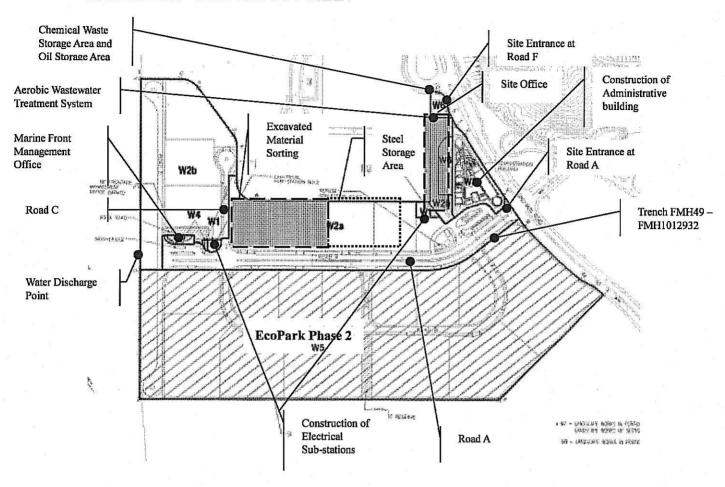
Environmental Management Plan.

Oil was found accumulated at the bottom of cabinets in Oil Storage Area. The Contractor has removed oil from cabinets.

Three empty oil containers placed beside Chemical Waste Storage Area were not stored in the designated contained area. The Contractor rectified by properly storing these containers in the designated contained area.

The Contractor was advised to pay more efforts on environmental concerns and awareness such as wastewater discharge, the maintenance of the silt curtain and handling and storage of chemical wastes.

#### APPENDIX 1 - SITE LAYOUT PLAN



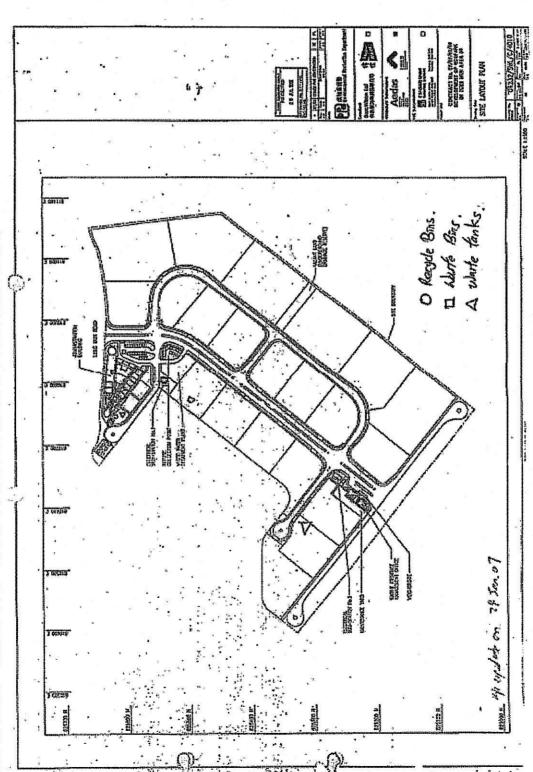
# APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF AN ECOPARK IN TUEN MUN AREA 38

Company/Department	Name	Position	Telephone
Scott Wilson Ltd.	Mike Bains	Independent Environmental Checker	
Scott Wilson Ltd.	Mr. Michael Lo	Senior Resident Engineer	6290 8860
Scott Wilson Ltd.	Mr. Andy Cheung	Resident Engineer	6111 9703
Scott Wilson Ltd.	Mr. C S Lam	Senior Inspector of Works	9861 8011
Kaden Construction Limited	Mr. K M Book	Project Manager	9193 8680
Kaden Construction Limited	Mr. Stephen Leung	Section Agent	9071 7657
Environmental Pioneers & Solutions Limited	Miss. Patricia Chung	Environmental Team Leader	2185 0123
Environmental Pioneers & Solutions Limited	Mr. Harvey Yung	Environmental Technician	2185 0172
Environmental Pioneers & Solutions Limited	Mr. Lam Ho Chun	Environmental Technician	2185 0154

Development of an EcoPark in Tuen Mun Area 38

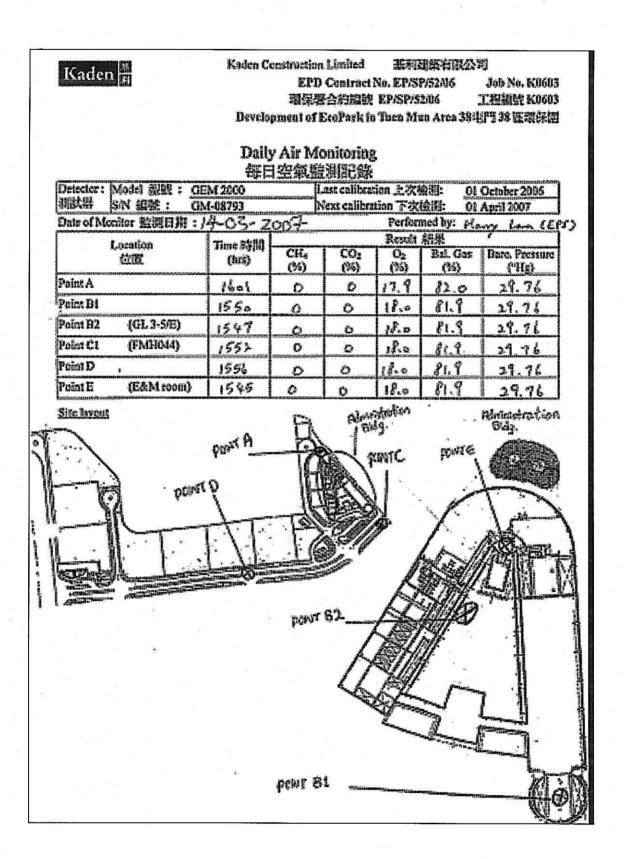
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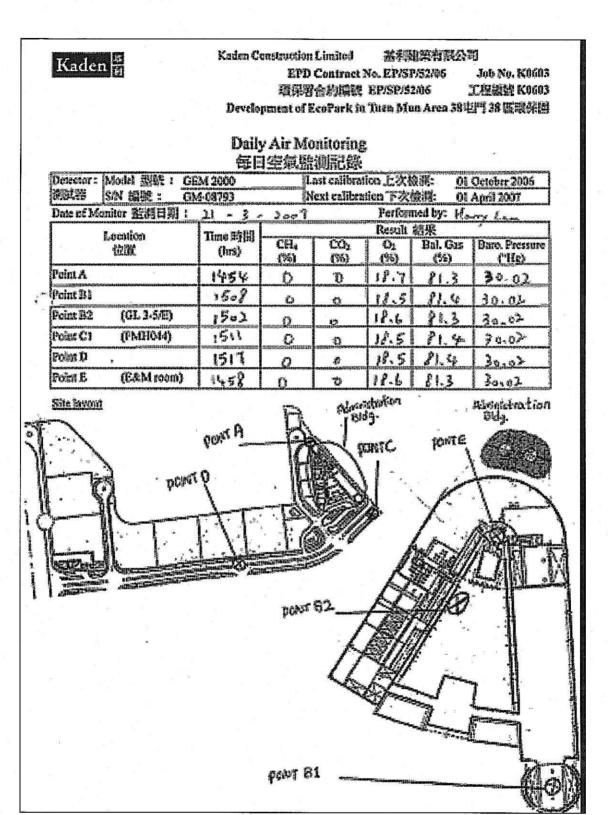
APPENDIX 3 – SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS



## APPENDIX 4 - ORIGINAL LANDFILL GAS FIELD MEASUREMENT RECORDING SHEETS

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# APPENDIX 5 - CUMULATIVE LOG OF COMPLAINTS

Environmental	No. of Outstanding	No. of complaints received in March 2007	Cumulative no. of complaints received since the
Parameters	Complaints		commencement of project
Air	0	0	1
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
[otal	0	0	1

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Log Ref. Date of Compliant received	Log Ref. Date of Location Complainant Compliant // Date	Complainant // Date	Details of Complaint	Investigation /Mitigation Action	Investigated by/ Date
	1	1	1		