

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

ENVIRONMENTAL MONITORING AND AUDIT

MONTHLY EM&A REPORT for

December 2008

Environmental Pioneers & Solutions Limited
8/F, Chaiwan Industrial Centre Building
20 Lee Chung Street, Chaiwan, Hong Kong
Tel: 2889 0569 Fax: 2856 2010

APPROVAL SHEET

DOCUMENT DATE: 31 December 2008

Prepared and Certified by: ET Leader (Environmental Pioneers & Solutions Limited)

Signature: _____
Miss Patricia Chung

Date: _____

Verified by: _____
IEC*

Date: _____

* IEC – Independent Environmental Checker

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1. BASIC PROJECT INFORMATION	5
2. SUMMARY OF WORK ACTIVITIES AND CONSTRUCTION STATUS.....	7
3. STATUS OF ENVIRONMENTAL PROTECTION AND SITE INSPECTIONS....	9
4. SUMMARY OF ENVIRONMENTAL PERMIT AND LICENCES	14
5. CUMULATIVE LOG OF COMPLAINTS AND REMEDIAL ACTION	15
6. CUMULATIVE LOG OF NOTIFICATION OF SUMMONS AND PROSECUTIONS	15
7. CONCLUSION	15
APPENDIX 1 - SITE LAYOUT PLAN.....	17
APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF ECOPARK IN TUEN MUN AREA 38	17
APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF ECOPARK IN TUEN MUN AREA 38	18
APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS.....	19
APPENDIX 4 - ORIGINAL LANDFILL GAS FIELD MEASUREMENT RECORDING SHEETS.....	21
APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS	24

EXECUTIVE SUMMARY

This is the thirtieth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled “Development of 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 December 2008.

The site activities in the reporting period mainly consisted of excavation and site formation works in Phase II construction site.

Several environmental issues, such as dust problem arising from open stockpiles of excavated materials and accumulated water in excavated pits, have been identified by ET during weekly site inspections in the reporting month. Contractor has implemented some mitigation measures to address those problems as advised by ET. Some of the measures taken by the contractor were considered as effective to minimize negative impact to the environment. On-going investigation will be carried out to observe performance and effectiveness of those measures. Outstanding environmental items will be inspected in the following month.

LFG monitoring was carried out again since 12 December, on weekly basis, when excavation works began in Phase II construction site. The measurement results from ET shown in Table 3.5 were within Action and Limit Levels in accordance with EM&A manual.

There were no notifications of summons or successful prosecution during December 2008.

Planned activities for January 2009 with regard to development of EcoPark consist of:

- 1) Site formation works,
- 2) Excavation works and
- 3) Road formation works.

1. BASIC PROJECT INFORMATION

1.1 Introduction

This is the thirtieth monthly Environmental Monitoring and Audit (EM&A) Report for the Environmental Protection Department Contract No. EP/SP/52/06 entitled “Development of 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 December 2008. 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).

The construction works of Phase I have already commenced in July 2006 and has been completed in November 2008.

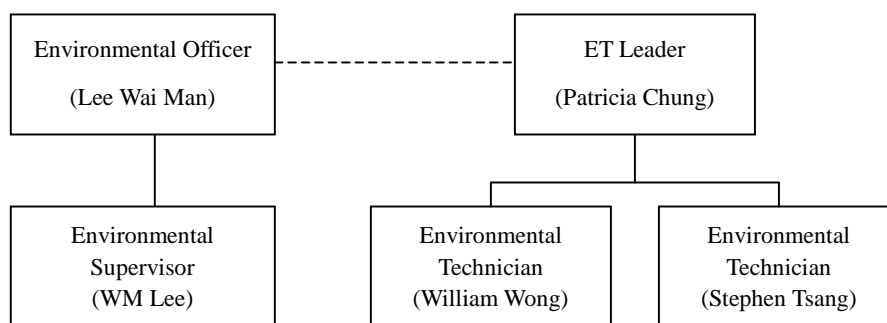
The construction works of Phase II commenced in December 2008 and is anticipated to be completed in December 2009.

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 December 2008		
Item	Work Activities & Location	Date of Occurrence
1	Site formation works	1 Dec 2008 – 31 Dec 2008
2	Excavation works	1 Dec 2008 – 31 Dec 2008

Machineries		
	Equipment/ Plant	Quantity
1	Mobile Crane	0
2	Excavator	6
3	Generator	2
4	Air Compressor	1
5	Roller	0
6	Loader	1
7	Grab Lorry	0
8	Crane Lorry	1
9	Water Truck	1
10	Dump Truck	1

Remarks:

- As informed by the Contractor, most equipment is 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 month (January 2009). The anticipated environmental issues are summarized as follow:

Table 2.2 Construction Program and Anticipated Environmental Issues		
Item	Works	Anticipated Environmental Issues
1	Site formation works, excavation works & road works	<ul style="list-style-type: none"> - Generation of C&D waste; excavated material should be reused as much as practicable. - Dust may be generated; the wheel washing machine should be in operation. - Haul road should be sprayed regularly, by truck or sprinkler. - Stagnant water should be removed. - Mosquito mitigation measures should be implemented. - Landfill gas monitoring should be carried out.

The site inspection schedule for the next month (January 2009) is designated on 2, 9, 16, 23 & 30 of January 2009.

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. Regular site inspections should be carried out by the ET once per week during construction phase.

Outstanding issues at the end of November 2008 includes:

- 1) A dead tree observed at Road C of Phase I construction site on 28 November 2008; and,
- 2) The three plastic chemical drums adjacent to the cooling tower inside administration building with no drip pan provided.

Site inspection for Phase I area has been conducted on 12 December 2008 to examine the above outstanding issues. The dead tree observed at Road C was removed and drip pan has not yet been provided for the three plastic chemical drums adjacent to the cooling tower. Contractor was reminded again to accommodate the drums in drip pans.

Site inspections for Phase II construction site were conducted on 5, 12, 19 and 23 of December 2008.

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 Inspections				
Date	Observations	Advice from ET	Action taken	Closing Date
05 Dec 08	Open stockpiles of excavated materials were found in the site.	Contractor was reminded to take appropriate dust suppression measures such as covering stockpiles with tarpaulin or regular water spraying.	Water spraying vehicle has been provided for dust suppression on 19 Dec 08. Water pumped out from excavated pit was used for topsoil watering.	On- going

Table 3.1 Summary of Site Inspections

Date	Observations	Advice from ET	Action taken	Closing Date
05 Dec 08	Groundwater had been found accumulated in excavated pits.	Contractor was reminded to provide suitable silt removal facilities whenever necessary.	Accumulated water was pumped away before site inspection on 12 Dec 08. Pumped muddy water simply soaked away into soil. Ready-to-use sedimentation tanks were installed on site on 19 Dec 08.	19 Dec 08
05 Dec 08 12 Dec 08	A proper LFG monitoring instrument was not available on site.	Contractor was reminded to provide a proper LFG monitoring instrument.	Action taken as advised.	19 Dec 08
05 Dec 08	No chemical toilet have been provided at construction site of Phase II	Chemical toilet should be provided in Phase II construction site by a licensed contractor.	Action taken as advised.	12 Dec 08
12 Dec 08	Stagnant water was observed at the entrance of Phase II construction site.	Contractor was reminded to treat accumulated water properly.	Sedimentation tanks were installed at the entrance for treating muddy water.	19 Dec 08
05 Dec 08 19 Dec 08	Chemical storage cabins had been moved to Phase II construction site. Some of the labels were discolored.	Contractor was reminded to replace discolored labels and keep the cabins in good condition.	Discolored labels have been replaced by contractor.	23 Dec 08
12 Dec 08 19 Dec 08	Some of the hoardings along the interface of Phase I and II site was removed.	Contractor was reminded to re-install hoardings for dust control.	Awaiting materials for hoarding installation. Progress to be checked in the next reporting month.	--
19 Dec 08	Several chemical storage tanks without labels and drip pans have been found along Road F of Phase I construction site.	Contractor was reminded again to better maintain all chemical storage tanks in both Phase I and II construction site.	To be checked in the next reporting month.	--
23 Dec 08	Stockpiles of solid waste material were found at the entrance of Phase II construction site.	Contractor was reminded to assign designated areas for temporary storage before disposal.	To be checked in the next reporting month.	--

3.2 Air Dust

Excavation work commenced in Phase II construction site. Dust problem may be arisen when stockpiles of excavated materials are not enclosed, covered or dampened during dry or windy conditions.

3.3 Noise

The major noise source was vehicle movement and machinery in the EcoPark. Since the nearby NSRs were remote, the noise impact was minimal. There was no specific observation noted regarding noise issue. The Contractor has obtained the Construction Noise Permit on 07 August 2007 but it had been expired on 28 Feb 2008. The contractor should renew the permit as necessary.

3.4 Surface Water Quality

Since there was no water discharge at manhole, the Contractor removed the silt curtain installed at discharge point on 4 April 2007, as agreed by the Engineer's Representative. No muddy water was observed at discharge point for Phase I construction site. As informed by Engineer's Representative, there was no direct water discharge at manhole in Phase II construction site. No muddy water discharge is expected.

Chemical toilets (1 nos.) have been provided in Phase II construction site by a licensed contractor, of which sewage generated is collected every three to five days without causing contamination on surface water. The Effluent Discharge License was issued to the Contractor on 20 November 2006.

The temporary storage tank was used to store the effluent of aerobic wastewater treatment system and the stored effluent was pumped away regularly. As checked by the ET, there was no effluent discharge into the storm water drain. To avoid any sewage overflow, frequent checking is required after the commencement of Phase II construction works.

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. Some of the hoardings have been removed and will be re-installed at the interface between Phase I and Phase II construction site.

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

3.6 Waste / Chemical Waste

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 revised site layout plan for refuse collection points as shown in Appendix 3.

Waste dumpers were used for the collection and storage of general waste. Temporary storage areas for waste metals and waste tyres were established in Phase I construction site. For Phase II construction site, designated refuse collection point will be established whenever necessary.

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 access 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.

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

Table 3.4 provides a summary table of waste disposal in December 2008. 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 December 2008			
Type of Waste	Disposal Site	Quantity	Remarks
General Waste	WENT Landfill	11 tonnes	-
Inert C&D Material	Public Fill Facility	4520 tonnes	-

3.7 Landfill Gas

LFG monitoring started again in December when excavation works begin for Phase II construction. Landfill gas (LFG) monitoring was carried out on site at four (4) locations, as instructed by the Engineer's Representative. LFG measurements on 12, 19 and 23 December 2008 are summarized in Table 3.5. Measurement results are within the Action / Limit Levels in accordance with the EM&A Manual, as shown in Table 3.6.

Table 3.5 Summary of LFG Measurement for December 2008						
Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH ₄) %LEL	Carbon Dioxide (CO ₂) %LEL	Oxygen (O ₂)
FMH 37	12 December 08	11:23	Fine	N/A*	N/A*	20.9%
FMH 35	12 December 08	11:30	Fine	N/A*	N/A*	20.9%
FMH 33 – 34	12 December 08	11:34	Fine	N/A*	N/A*	20.9%
FMH 33	12 December 08	11:37	Fine	N/A*	N/A*	20.9%
FMH 37	19 December 08	11:15	Fine	0.0%	0.0%	20.9%
FMH 35	19 December 08	11:21	Fine	0.0%	0.0%	20.9%
FMH 33 – 34	19 December 08	11:27	Fine	0.0%	0.0%	21.3%
FMH 33	19 December 08	11:32	Fine	0.0%	0.0%	21.3%

Table 3.5 Summary of LFG Measurement for December 2008

Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH ₄) %LEL	Carbon Dioxide (CO ₂) %LEL	Oxygen (O ₂)
FMH 37	23 December 08	11:23	Fine	0.0%	0.0%	20.9%
FMH 35	23 December 08	11:29	Fine	0.0%	0.0%	20.9%
FMH 33 – 34	23 December 08	11:35	Fine	0.0%	0.0%	20.9%
FMH 33	23 December 08	11:38	Fine	0.0%	0.0%	21.3%
Remarks: 1) As agreed by the Engineer's Representative, the landfill gas measurements on December 2008 were carried out with two instruments: one for the measurements of methane and carbon dioxide, another for the measurement of oxygen. * Instrument, provided by contractor, for measuring methane and carbon dioxide has not yet been available until 19 Dec 2008.						

Table 3.6 Action Levels, Limit Levels and Event and Action Plan for LFG (From EM&A Manual)

Parameter	Level	Action
Oxygen	Action Level < 19% O ₂	Ventilate trench/ void to restore O ₂ to > 19%
	Limit Level < 18% O ₂	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore O ₂ to > 19%
Methane (CH ₄)	Action Level >10% LEL	Post "No Smoking" signs Prohibit hot works Increase ventilation to restore CH ₄ to <10% LEL
	Limit Level >20% LEL	Stop works Evacuate personnel/prohibit entry Increase ventilation to restore CH ₄ to <10% LEL
Carbon Dioxide (CO ₂)	Action Level >0.5% CO ₂	Ventilate to restore CO ₂ to < 0.5%
	Limit Level >1.5% CO ₂	Stop works 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 December 2008, 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.

Table 4.1 Summary of Environmental Permits/ Licences				
Description	License / Permit No.#	Date of Issue	Date of Expiry	Status/Remarks
Environmental Permit	EP-226/2005	9-Sept-2005	--	Issued
Registration of Waste Producer	5111-421-K2869-02	27-Jul-2006	--	Issued
Construction Noise Permit	GW-RW0402-07	07-Aug-2007	28-Feb-2008	Expired
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 December 2008.

7. CONCLUSION

There is no summon nor prosecutions reported during December 2008.

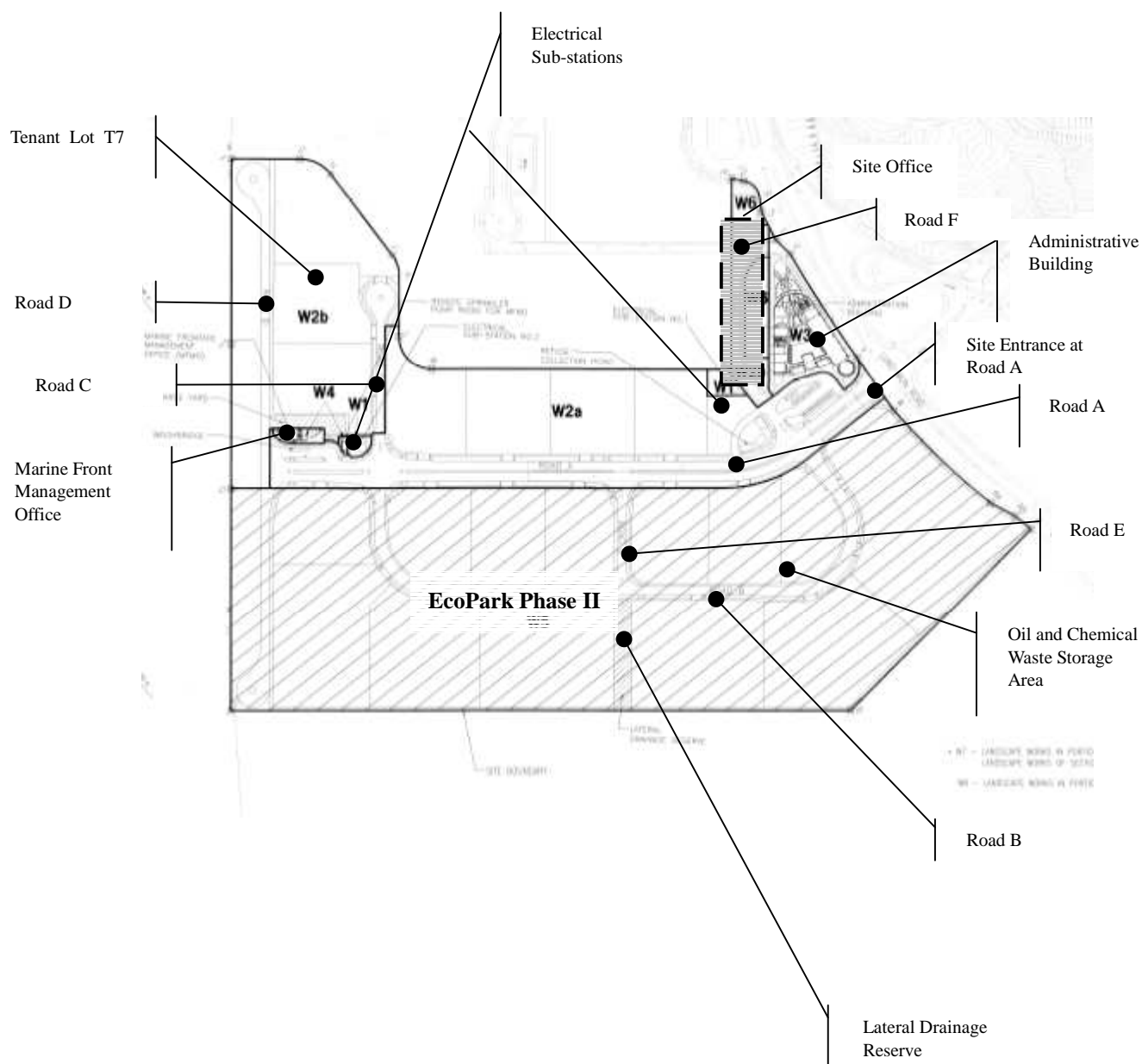
Phase II construction works have been commenced during December 2008, several environmental issues, such as dust problem arising from open stockpiles of excavated materials and accumulated water in excavated pits, have been identified by ET during weekly site inspections. Contractor has implemented some mitigation measures to address those problems as advised. On-going investigation will be carried out to observe performance and effectiveness of those measures taken.

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.

LFG monitoring was carried out again in December, on weekly basis, when excavation works began in Phase II construction site. The measurement results from ET shown in Table 3.5 were within Action and Limit Levels in accordance with EM&A manual.

Water accumulated in ditch, artificial ponds and manhole covers has to be drained away regularly to avoid mosquito breeding. Furthermore, regularly pest control measures are also needed to avoid mosquito and ant problems on site.

APPENDIX 1 - SITE LAYOUT PLAN



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

Company/Department	Name	Position	Telephone
Scott Wilson Ltd.	Harold Insley	Independent Environmental Checker	2410 3858
Scott Wilson Ltd.	Mr. Andy Cheung	Resident Engineer	6111 9703
Scott Wilson Ltd.	Mr. T W Wong	Inspector	6111 9705
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. William Wong	Environmental Technician	2185 0154
Environmental Pioneers & Solutions Limited	Mr. Stephen Tsang	Environmental Technician	2185 0172

Site Layout Plan for Refuse Collection Points

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

Environmental Pioneers and Solutions Limited

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

Landfill Gas Monitoring – Field Measurement Recording SheetDate of Monitoring: 12 Dec 2008Weather condition: FineMonitoring performed by: William Wong

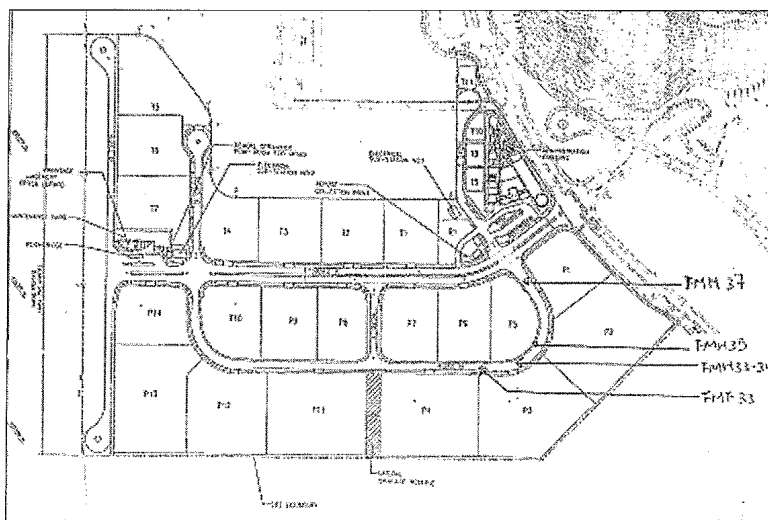
Monitoring instrument:

Instruments	Model: GEM 2000 Plus	Last calibration:	18 Dec 2008
	S/N: GM-08793 *	Next calibration:	17 Dec 2009

*Instrument not yet available to be used

Monitoring results:

Location	Time	Results				
		Methane (CH ₄)	Carbon Dioxide (CO ₂)	Oxygen (O ₂)	Bal. Gas	Baro. Pressure (%)
FMH 33	11:37	N/A	N/A	20.9%	N/A	N/A
FMH 33-34	11:34	N/A	N/A	20.9%	N/A	N/A
FMH 35	11:30	N/A	N/A	20.9%	N/A	N/A
FMH 37	11:23	N/A	N/A	20.9%	N/A	N/A

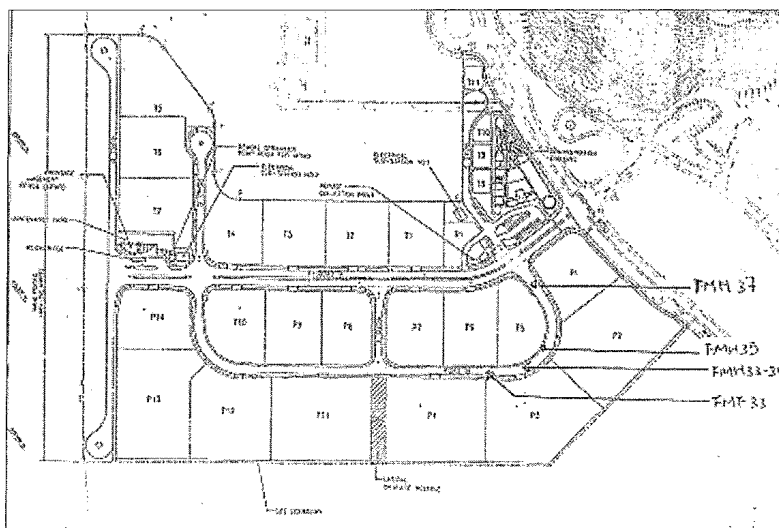
Instrument for O₂ measurement: GasAlert MicroClip GAMIC-4-DL2 Serial no.:S103-13348

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

Date of Monitoring: 19 Dec 2008
Weather condition: Fine
Monitoring performed by: William Wong
Monitoring instrument:

Monitoring results:

Instrument for O₂ measurement: GasAlert MicroClip GAMIC-4-DL2 Serial no.:S103-13348



Environmental Pioneers and Solutions Limited

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

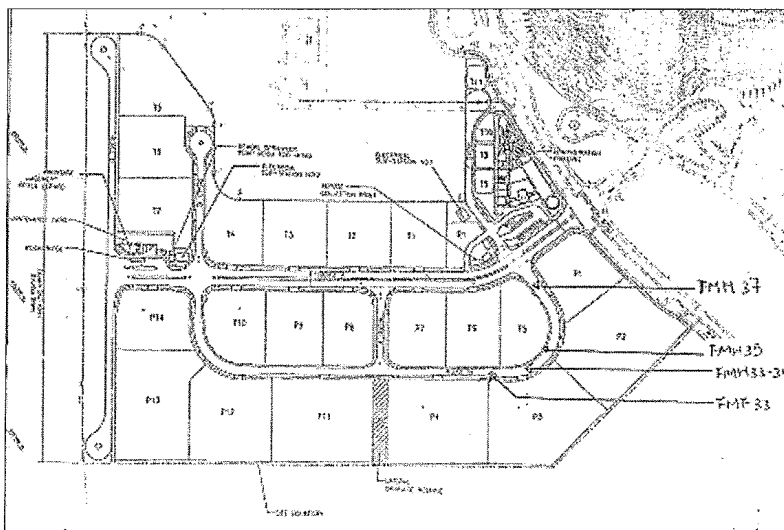
Landfill Gas Monitoring – Field Measurement Recording Sheet

Date of Monitoring: 23 Dec 2008
 Weather condition: Fine
 Monitoring performed by: William Wong
 Monitoring instrument:

Instruments	Model: GEM 2000 Plus	Last calibration:	18 Dec 2008
	S/N: GM-08793	Next calibration:	17 Dec 2009

Monitoring results:

Location	Time	Results				
		Methane (CH ₄)	Carbon Dioxide (CO ₂)	Oxygen (O ₂)	Bal. Gas	Baro. Pressure (%)
FMH 33	11:38	0.00%	0.00%	21.3%	85.0%	30.26%
FMH 33 – 34	11:35	0.00%	0.00%	20.9%	85.1%	30.26%
FMH 35	11:29	0.00%	0.00%	20.9%	84.8%	30.26%
FMH 37	11:23	0.00%	0.00%	20.9%	84.6%	30.26%

Instrument for O₂ measurement: GasAlert MicroClip GAMIC-4-DL2 Serial no.:S103-13348

APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS**CUMULATIVE LOG OF COMPLAINTS**

Environmental Parameters	No. of Outstanding Complaints	No. of complaints received in December 2008	Cumulative no. of complaints received since the commencement of project
Air	0	0	2
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	2

DETAILS OF COMPLAINTS AND REMEDIAL ACTIONS

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