

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

ENVIRONMENTAL MONITORING AND AUDIT

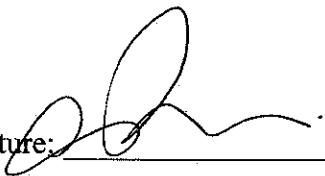
MONTHLY EM&A REPORT for

August 2009

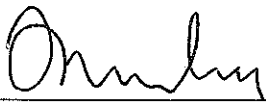
APPROVAL SHEET

DOCUMENT DATE: 31 August 2009

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

Signature: 
Miss Patricia Chung

18 SEP 2009
Date: _____

Verified by: 
IEC*

22 SEP 2009
Date: _____

* IEC – Independent Environmental Checker

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1. BASIC PROJECT INFORMATION	6
2. SUMMARY OF WORK ACTIVITIES AND CONSTRUCTION STATUS	8
3. STATUS OF ENVIRONMENTAL PROTECTION AND SITE INSPECTIONS ..	10
4. SUMMARY OF ENVIRONMENTAL PERMIT AND LICENCES	17
5. CUMULATIVE LOG OF COMPLAINTS AND REMEDIAL ACTION	17
6. CUMULATIVE LOG OF NOTIFICATION OF SUMMONS AND PROSECUTIONS	17
7. CONCLUSION	17
APPENDIX 1 - SITE LAYOUT PLAN	19
APPENDIX 2 - THE CONTACT PERSONS, TELEPHONE NUMBERS OF KEY PERSONNEL FOR DEVELOPMENT OF ECOPARK IN TUEN MUN AREA 38	20
APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS	21
APPENDIX 4 - ORIGINAL LANDFILL GAS FIELD MEASUREMENT RECORDING SHEETS	22
APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS.....	26

EXECUTIVE SUMMARY

This is the thirty-eighth 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/A).

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 August 2009.

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

Several environmental issues, such as muddy water brought to Road A by vehicles exiting construction site, accumulated water in excavation pits near the waterfront and temporary removal of hoardings, 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.

Weekly LFG monitoring on points S3 and the closed site exit are being carried out in the reporting month. 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 August 2009.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by the contractor, trial for the concerned summons was conducted on 13

August 2009 and they have been acquitted for the case.

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

- 1) Site formation works,
- 2) Excavation works,
- 3) Road formation works and
- 4) Construction of drainage, sewerage & water mains

1. BASIC PROJECT INFORMATION

1.1 Introduction

This is the thirty-eighth 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 August 2009. 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 have been completed in November 2008.

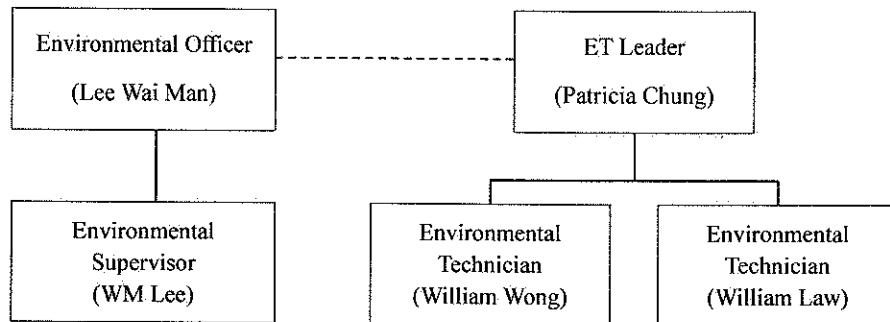
The construction works of Phase II commenced in December 2008 and is anticipated to be completed in December 2009.

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.

Item	Work Activities & Location	Date of Occurrence
1	Site formation works	01 August 2009 – 31 August 2009
2	Excavation works	01 August 2009 – 31 August 2009
3	Road Formation works	01 August 2009 – 31 August 2009
4	Construction of drainage	01 August 2009 – 31 August 2009

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 (September 2009). The anticipated environmental issues are summarized as follow:

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.
2	Construction of drainage, sewerage & water mains	<ul style="list-style-type: none"> - Generation of C&D waste; excavated material should be used as much as practicable - Dust may be generated; the wheel washing machine should be in operation

The site inspection schedule for the next month (September 2009) is designated on 04, 11, 18 and 25 of September 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 July 2009 includes:

- 1) Hoardings in some sections beside the Lung Mun Road have been temporarily removed due to the construction program. Contractor took action to place fabric wraps as temporarily measure for dust suppression before reinstallation of hoardings as observed during inspection on 14 August 2009. Contractor was reminded to re-install hoardings immediately when construction program in the sections is finished.
- 2) Site water generated from wheel washing machine has not been collected properly. Contractor was reminded to improve the facilities by providing a water flow drain to re-route site water for proper treatment. As observed during inspection carried out on 14 August 2009, contractor constructed a bump to direct the muddy water back into the construction site.
- 3) Drip pan has not yet been provided for the three plastic chemical drums adjacent to the cooling tower in the administration building. ET was informed that a proper drip pan has been designed and will be constructed in September.

Site inspections for Phase II construction site were conducted on 10, 14, 21 and 28 of August 2009.

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:

Date	Observations	Advice from ET	Action taken	Closing Date
10 August 09	A few oil containers are found near the chemical drum storage cabinet without a drip tray.	Contractor was reminded to place chemical containers on a drip tray or inside the chemical drum storage cabinet immediately after use.	Contractor took action to place oil containers without a drip tray inside the chemical drum storage.	14 August 09
14 August 09	The bump constructed to prevent site water generated from automatic wheel washing machine from flowing into storm drains in Phase I was not effective enough to stop muddy water from flowing into the storm drains.	Contractor was reminded to rectify the bump or build new drains to properly direct the muddy water back into the construction site.	Contractor took action to rectify the bump to properly direct the muddy water back into the construction site.	21 August 09
14 August 09	Muddy water runoff was observed at the waterfront.	Contractor was reminded to monitor the muddy water runoff from Phase II and consider using slit curtains when necessary.	Contractor continually to monitor muddy water runoff in heavy rain days. No muddy water runoff has been observed at the waterfront thereafter	21 August 09
21 August 09	Food and drink containers and remains are found near resting areas.	Contractor was reminded to provide proper garbage disposal bins for workers and remind workers to maintain proper housekeeping.	Contractor took action to collect food and drink containers and reminds near resting areas.	28 August 09
21 August 09	Dry stockpiles brought dust into the air were observed in various locations of the construction site.	Contractor was advised to provide dust suppression measures such as frequent water spraying and cover stockpiles with tarpaulin.	Contractor has taken action to spray water on dry roads and stockpiles.	28 August 09
21 August 09 28 August 09	Road A near waterfront is covered with dirt and dust, due to construction vehicles using the exit without any wheel washing facilities.	Contractor was reminded to properly fence off the site entrances and exits without any wheel washing facilities.	--	To be followed in the next reporting month.
28 August 09	The doors for the chemical waste storage were bent and did not close and lock properly.	Contractor was reminded to monitor and maintain the chemical waste storage facilities.	Contractor immediately appointed a worker to fix the doors.	To be followed in the next reporting month.

3.2 Air Dust

Excavation work is being carried out 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. Dust suppression measures such as water spraying and coverings with tarpaulin on stockpiles have been observed in the reporting month.

As observed during inspection in the reporting month, many of the stockpile materials have been used for backfilling. Contractor was reminded to continue routine dust suppression measures such as regular water spraying on site.

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 19 August 2009 and it will be expire on 18 Jan 2010.

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. Muddy water was observed at discharge point for Phase I construction site on 14 August 2009. The contractor was reminded to consider using a slit curtain if the discharge continues. 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.

Site water generated from automatic wheel washing machine is not collected properly and hence flowed into the storm drains on Road A as observed during inspection on 31 July 2009. Contractor built a bump to direct muddy water generated from the automatic wheel washing machine back into the construction site on 14 August 2009 and rectified the bump on 21 August 2009. The amount of muddy water flowed into the storm drains in Road A greatly reduced and ET will continue to monitor in the coming month on this issue.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by the contractor, trial for the concerned summons was conducted on 13 August 2009 and they have been acquitted for the case.

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 at the interface between Phase I and Phase II construction site. Re-installation has been completed as observed during inspection carried out on 24 April 2009.

During the reporting month, hoardings in some sections along Lung Mun Road have been temporarily removed due to the construction program. As observed during inspection on 14 August 2009, contractor took immediate action to place fabric wraps as temporarily measure for dust suppression before reinstallation of hoardings.

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, a designated refuse collection point has been established and location is shown in Appendix 3.

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 August 2009. The Contractor has been reminded to keep good record at site in order to have a clear presentation of waste disposal.

Type of Waste	Disposal Site	Quantity	Remarks
General Waste	WENT Landfill	13.5 tonnes	-
Inert C&D Material	Public Fill Facility	0 tonnes	-

3.7 Landfill Gas

Weekly LFG monitoring on points S3 and Site exit are being carried out in the reporting month.

Measurement results are summarized in Table 3.5. All results are within the Action / Limit Levels in accordance with the EM&A Manual, as shown in Table 3.6.

Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH ₄) %LEL	Carbon Dioxide (CO ₂) %LEL	Oxygen (O ₂)
S3	10 August 09	11:42	Sunny	0.00%	0.00%	19.8
Site exit	10 August 09	11:38	Sunny	0.00%	0.00%	20.1
S3	14 August 09	11:31	Sunny	0.00%	0.00%	20.3
Site exit	14 August 09	11:25	Sunny	0.00%	0.00%	20.6
S3	21 August 09	11:33	Sunny	0.00%	0.00%	20.0
Site exit	21 August 09	11:28	Sunny	0.00%	0.00%	20.0
S3	28 August 09	11:38	Sunny	0.00%	0.00%	20.1
Site exit	28 August 09	11:33	Sunny	0.00%	0.00%	20.1
Remarks:						

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 August 2009, 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
Environmental Permit	EP-226/2005/A	9-Sept-2005	--	Issued
Registration of Waste Producer	5111-421-K2869-02	27-Jul-2006	--	Issued
Construction Noise Permit	GW-RW0352-09	19-Aug-2009	18-Jan-2010	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 August 2009.

7. CONCLUSION

There is no summon nor prosecutions reported during August 2009.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to monitor the mitigation actions carried out by the contractor. There was no water discharge observed in the construction site during the reporting month. As informed by the contractor, trial for the concerned summons was conducted on 13 August 2009 and they have been acquitted for the case.

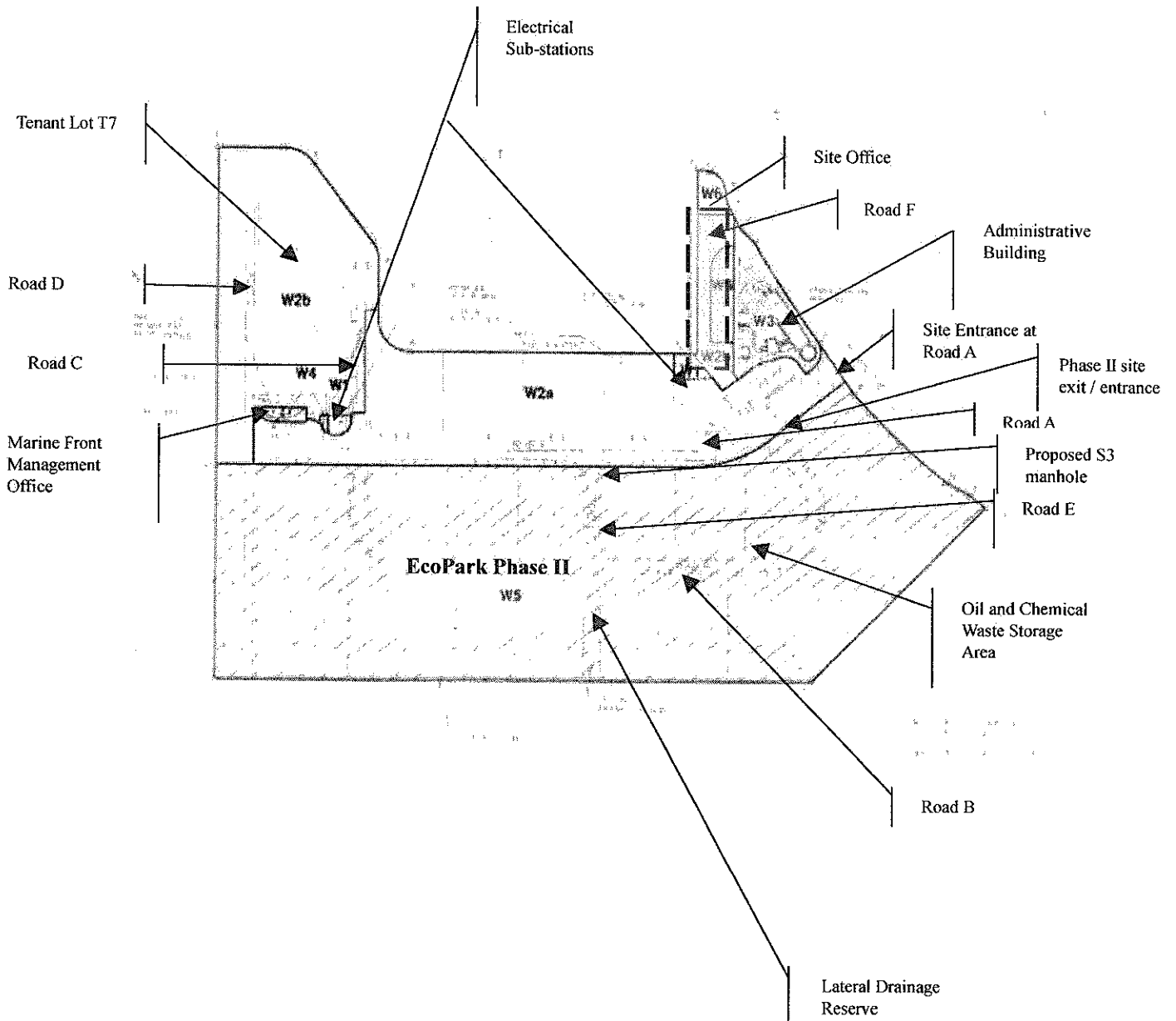
Several environmental issues, such as muddy water brought to Road A by vehicles exiting construction site and muddy water runoff at the waterfront, have been identified by ET during weekly site inspections in the reporting month. Contractor has implemented some mitigation measures to address those problems 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.

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.

Weekly LFG monitoring on points S3 and Site exit are being carried out in the reporting month. The measurement results from ET shown in Table 3.5 were within Action and Limit Levels in accordance with EM&A manual.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.

APPENDIX 1 - SITE LAYOUT PLAN



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

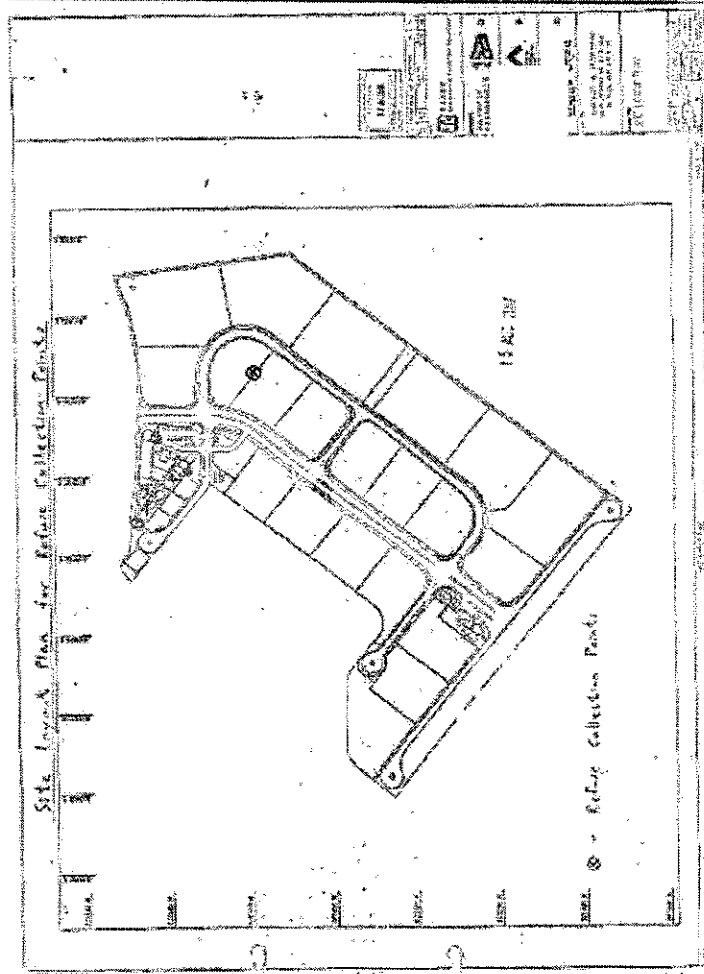
Company/Department	Name	Position	Telephone
Scott Wilson Ltd.	Harold Insley	Independent Environmental Checker	2410 3858
Scott Wilson Ltd.	Mr. Andy Cheung	Resident Engineer	6111 9703
Scott Wilson Ltd.	Mr. T W Wong	Inspector	6111 9705
Kaden Construction Limited	Mr. K M Book	Project Manager	9193 8680
Kaden 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. William Law	Environmental Technician	2185 0172

APPENDIX 3 – REVISED SITE LAYOUT PLAN FOR REFUSE COLLECTION POINTS

Development of EcoPark in Tuen Mun Area 38

Contract No. EP/SP/52/06
EM&A Report No. 38 (December 2008)

APPENDIX 3 – REVISED 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 Sheet

Date of Monitoring: 10/8/2009

Weather condition: Sunny

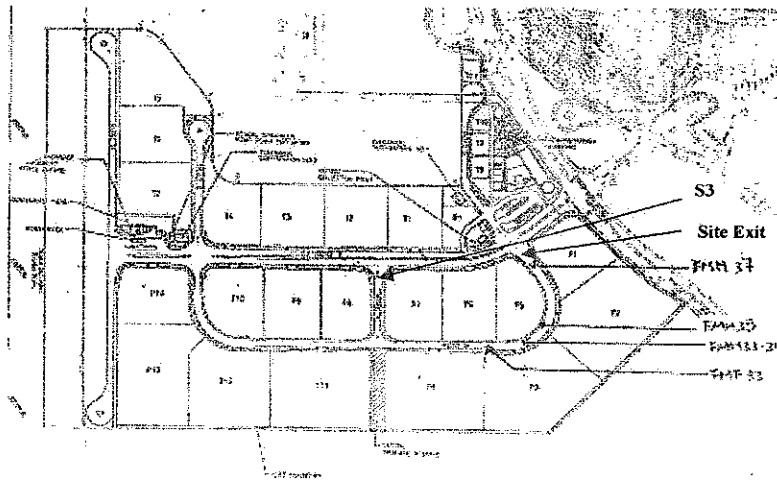
Monitoring performed by: William Law

Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Bal. Gas %	Baro. Pressure %
S3	11:42	00.0	00.0	19.8	80.2	29.41
Site exit	11:38	00.0	00.0	20.1	79.9	29.41



Environmental Pioneers and Solutions Limited

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

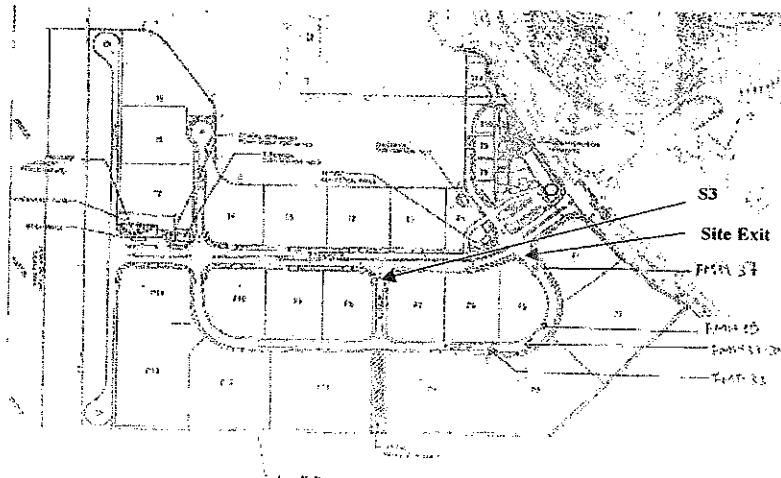
Landfill Gas Monitoring – Field Measurement Recording Sheet

Date of Monitoring: 14/8/2009
 Weather condition: Sunny
 Monitoring performed by: William Law
 Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Bal. Gas %	Baro. Pressure %
S3	11:31	00.0	00.0	20.3	79.7	29.78
Site exit	11:25	00.0	00.0	20.6	79.4	29.78



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: 21/8/2009

Weather condition: Sunny

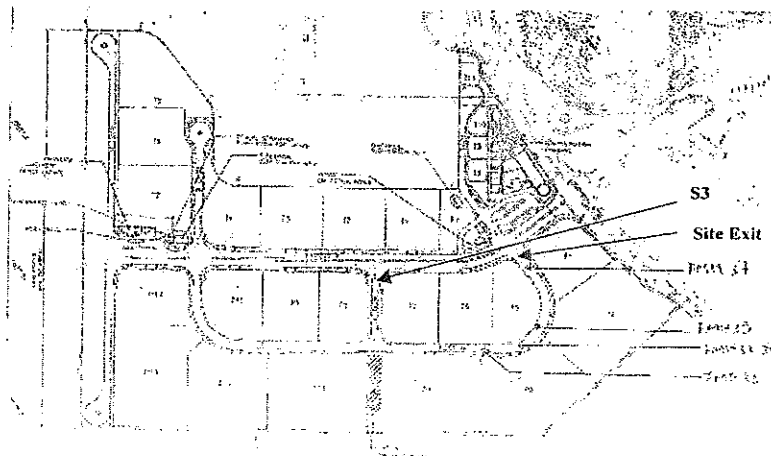
Monitoring performed by: William Law

Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Bal. Gas %	Baro. Pressure %
S3	11:33	00.0	00.0	20.0	80.0	29.68
Site exit	11:36	00.0	00.0	20.0	80.0	29.68



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: 28/8/2009

Weather condition: Sunny

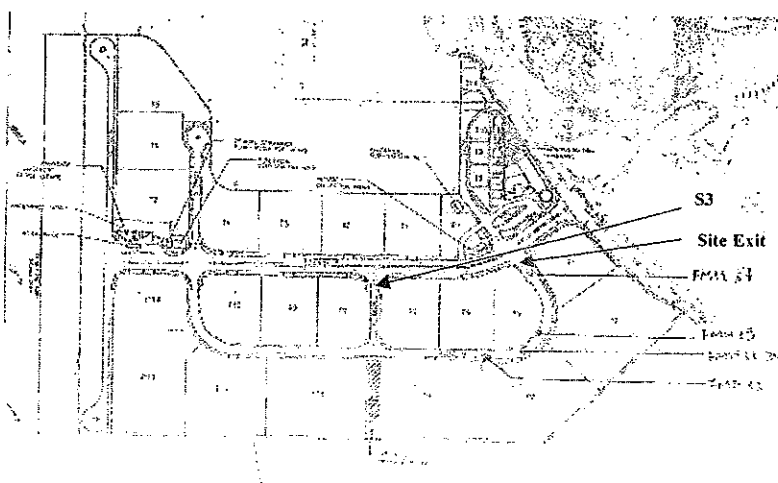
Monitoring performed by: William Law

Monitoring instrument:

Instruments	Model: GEM 2000	Last calibration:	03 April 2009
	S/N: GM-08793106	Next calibration:	02 April 2010

Monitoring results:

Location	Time	Results				
		Methane (CH ₄) %	Carbon Dioxide (CO ₂) %	Oxygen (O ₂) %	Bal. Gas %	Baro. Pressure %
S3	11:38	00.0	00.0	20.1	79.9	29.71
Site exit	11:33	00.0	00.0	20.1	79.9	29.71



APPENDIX 5 – CUMULATIVE LOG OF COMPLAINTS

CUMULATIVE LOG OF COMPLAINTS

Environmental Parameters	No. of Outstanding Complaints	No. of complaints received in August 2009	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
-	-	-	-	-	-	-