

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

ENVIRONMENTAL MONITORING AND AUDIT

MONTHLY EM&A REPORT for

July 2009

APPROVAL SHEET

DOCUMENT DATE: 31 July 2009

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Date: 08 AUG 2009

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IEC*

Date: 24 AUG 2009

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EXECUTIVE SUMMARY

This is the thirty-seventh 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 July 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 July 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 EPD on 4th of August, 2009, the contractor was informed in writing that

legal action would be considered against them on 27 April 2009.

Planned activities for August 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-seventh 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 July 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.

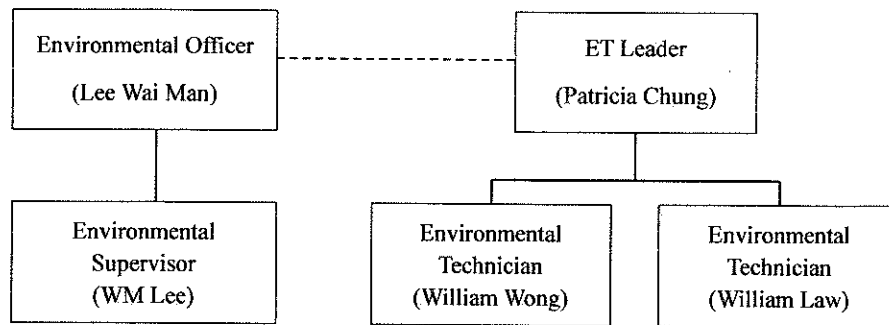
The construction works of Phase II commenced in December 2008 and is anticipated to be completed in December 2009.

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 July 2009 – 31 July 2009
2	Excavation works	01 July 2009 – 31 July 2009
3	Road Formation works	01 July 2009 – 31 July 2009
4	Construction of drainage	01 July 2009 – 31 July 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 (August 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 (August 2009) is designated on 07, 14, 21 and 28 of August 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 June 2009 includes:

- 1) Well-constructed wheel washing bay was not available for wheel washing machine at the exit of Phase II construction site. Manual wheel-washing facilities were provided at the temporary site exit. Contractor installed an automatic wheel washing machine at the new exit of Phase II construction site on 24 July 2009.
- 2) Chemical drums without drip trays have been observed outside chemical storage cabin in June 2009. Contractor took action to place chemical drums properly inside the chemical storage cabinet prior to inspection on 3 July 2009.
- 3) Numerous dusty stockpiles without sufficient effective dust suppression measures were observed during the month of June 2009. 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.
- 4) 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 the August.

Outstanding issues will be inspected in the next reporting month.

Site inspections for Phase II construction site were conducted on 03, 10, 17, 24 and 31 of July 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
03 July 09 14 July 09	Accumulated water has been observed in drip tray in Chemical Storage Area after rainy days.	Contractor was reminded to clear stagnant water regularly.	Contractor took action to remove rainwater accumulated in the chemical storage cabin.	17 July 2009
10 July 09	Hoardings in some sections along Road A of Phase I construction site have been temporarily removed due to the construction program.	Contractor was reminded to re-install hoardings immediately when construction program in the sections is finished.	Contractor took immediate action to place fabric wraps as temporary measure for dust suppression before reinstallation of hoardings.	17 July 2009
10 July 09	Muddy water brought to Road A by vehicles exiting construction site through the temporary exit.	Contractor was reminded that proper wheel washing machine and bay should be provided at the new site exit.	Contractor installed an automatic wheel washing machine in the new exit and blocked off the temporary exit.	To be followed in the next reporting month.
10 July 09	Chemical drums without drip tray have been observed near the waterfront.	Contractor was reminded to properly handle all chemical drums on site.	Contractor placed the said chemical drums in the chemical storage cabinet.	17 July 2009
24 July 09	Pool of accumulated water pumped from excavation pit has been found near Phase II construction entrance	Contractor was reminded to use water pipes with proper length to pump water to sedimentation area and should be treated properly to meet requirements specified in the issued discharge license, if appropriate.	Contractor removed the pool of accumulated water pumped from excavation pit.	31 July 2009
24 July 09	Empty chemical drums have been found placed in open space, in the proposed P4 area, with no drip trays and proper storage	Contractor was reminded to properly handle chemical drums on site	Contractor took action to remove the idle chemical drums	31 July 2009
31 July 09	Hoardings in some sections beside Lung Mun Road have been temporarily removed due to the construction program.	Contractor was reminded to re-install hoardings immediately when construction program in the sections is finished.	--	To be followed in the next reporting month.
31 July 09	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.	--	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 February 2009 and was reminded to renew the permit before it expires on 18 August 2009, 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.

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 was reminded to improve the facilities by providing a water flow drain to re-route site water for proper treatment. ET will continue to monitor in the coming month on this issue. The tentative completion date is 21 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 EPD on 4th of August, 2009, the contractor was informed in writing that legal action would be considered against them on 27 April 2009.

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 Road A of Phase I construction site have been temporarily removed due to the construction program. As observed during inspection on 17 July 2009, contractor took immediate action to place fabric wraps as temporarily measure for dust suppression before reinstallation of hoardings. Moreover, as observed during inspection on 31 July 2009, some sections along Lung Mun Road have been temporarily removed due to the construction program. Contractor was reminded to re-install the hoardings immediately when construction program in the sections is finished. ET will continue to monitor in the coming month on this issue.

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 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.

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 July 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	11 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.

Table 3.5 Summary of LFG Measurement for July 2009

Sampling Location	Date of Measurement	Sampling Time	Weather Condition	Methane (CH ₄) %LEL	Carbon Dioxide (CO ₂) %LEL	Oxygen (O ₂)
S3	03 July 09	10:23	Rain	0.00%	0.00%	20.4
Site exit	03 July 09	10:07	Rain	0.00%	0.00%	20.9
S3	10 July 09	11:26	Sunny	0.00%	0.00%	20.2
Site exit	10 July 09	11:37	Sunny	0.00%	0.00%	19.7
S3	17 July 09	11:04	Sunny	0.00%	0.00%	20.3
Site exit	17 July 09	11:20	Sunny	0.00%	0.00%	19.7
S3	24 July 09	11:34	Overcast	0.00%	0.00%	19.9
Site exit	24 July 09	11:16	Overcast	0.00%	0.00%	20.4
S3	31 July 09	11:08	Sunny	0.00%	0.00%	19.9
Site exit	31 July 09	11:00	Sunny	0.00%	0.00%	20.4

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 July 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-RW0041-09	19-Feb-2009	18-Aug-2009	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 July 2009.

7. CONCLUSION

There is no summon nor prosecutions reported during July 2009.

Regarding to the water discharge to storm drainage incident recorded in March 2009, ET continued to investigate and 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 EPD on 4th of August, 2009, the contractor was informed in writing that legal action would be considered against the contractor on 27 April 2009.

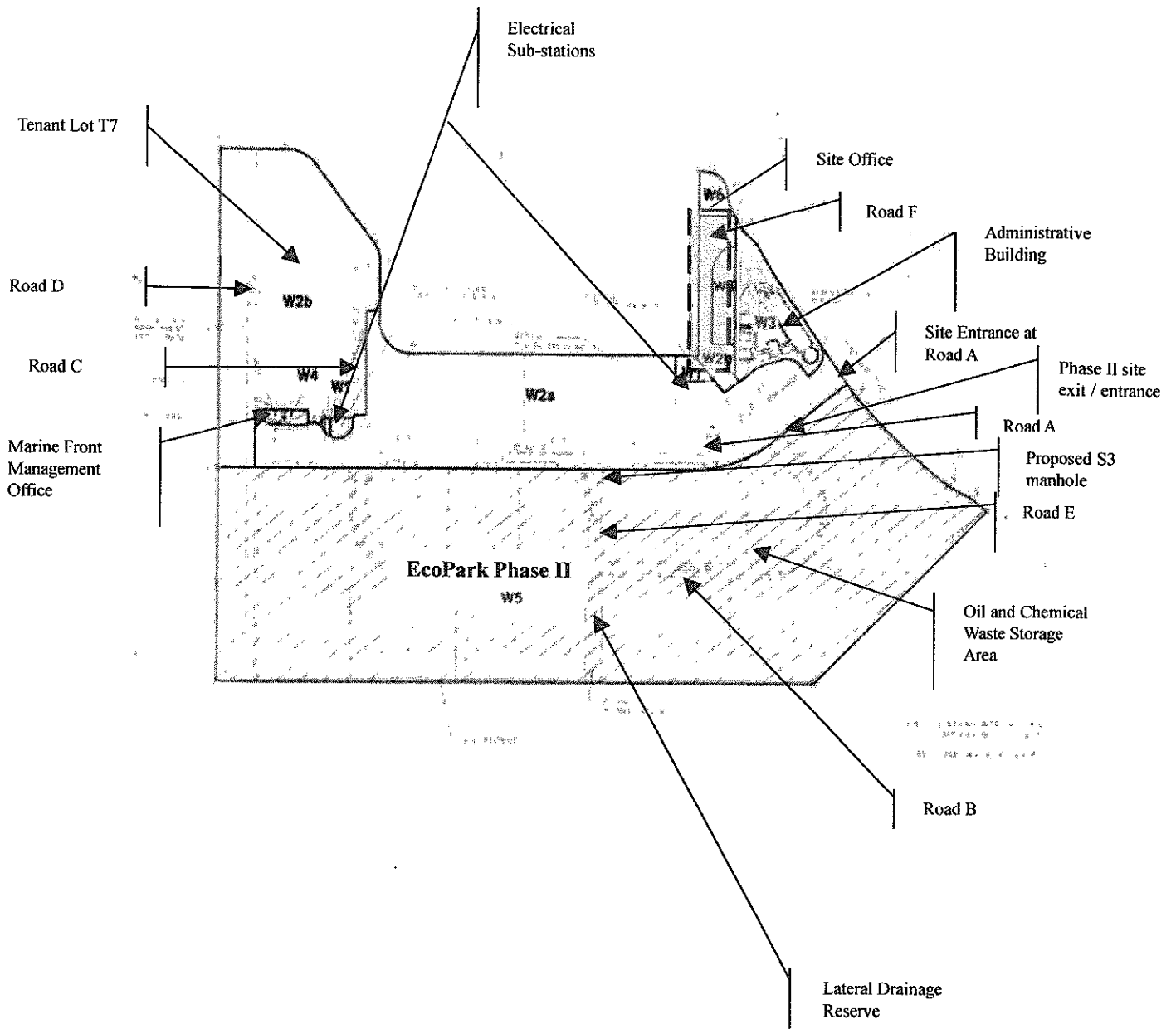
Several environmental issues, such as muddy water brought to Road A by vehicles exiting construction site, accumulated water in excavation pits near the waterfront and temporary removal of hoardings,, have been identified by ET during weekly site inspections in the reporting month. Contractor has implemented 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.

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

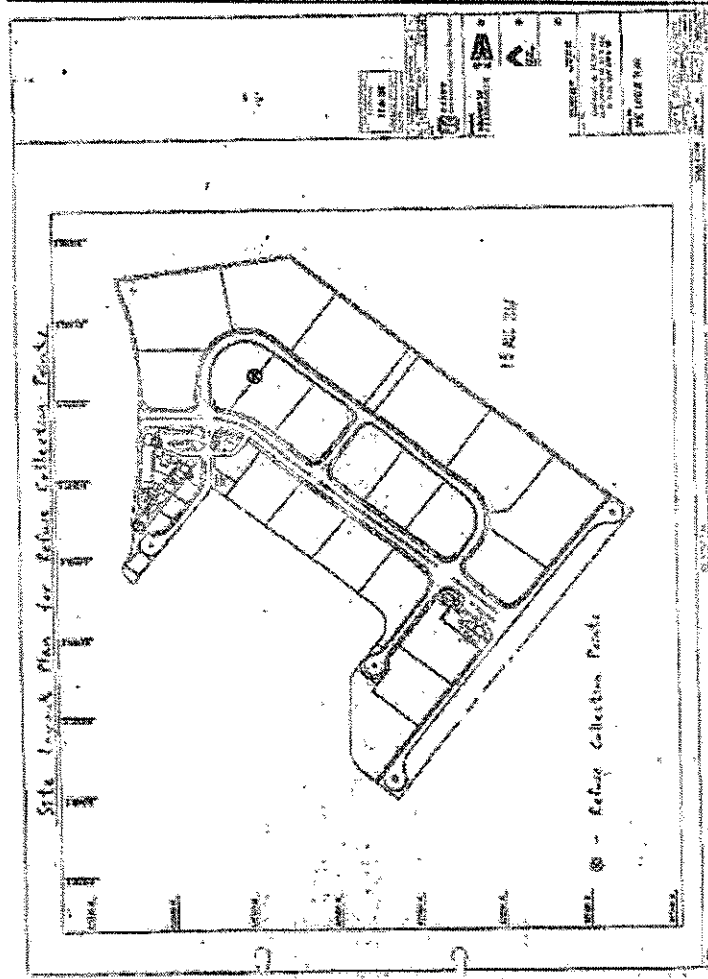
Company/Department	Name	Position	Telephone
Scott Wilson Ltd.	Harold Insley	Independent Environmental Checker	2410 3858
Scott Wilson Ltd.	Mr. Andy Cheung	Resident Engineer	6111 9703
Scott Wilson Ltd.	Mr. T W Wong	Inspector	6111 9705
Kaden Construction Limited	Mr. K M Book	Project Manager	9193 8680
Kaden 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. 39 (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

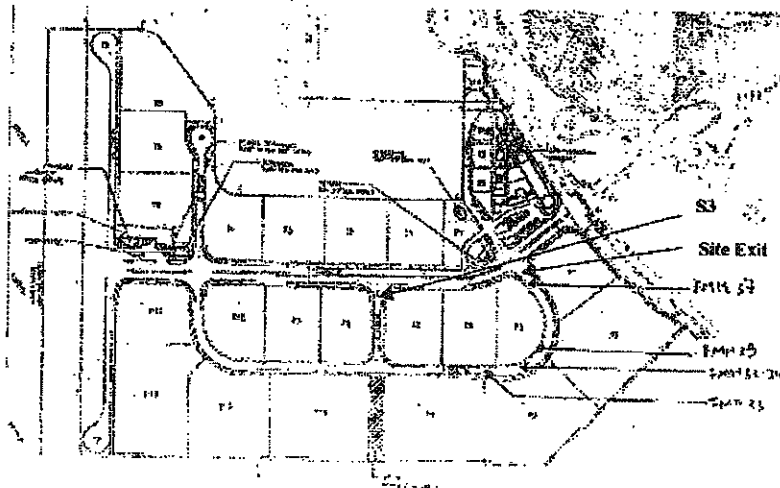
Landfill Gas Monitoring - Field Measurement Recording Sheet

Date of Monitoring: 3/7/2009
 Weather condition: Rain
 Monitoring performed by: Chung Pui Suen
 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	10:23	00.0	00.0	20.4	79.5	29.64
Site exit	10:07	00.0	00.0	20.9	79.1	29.64



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: 10/7/2009

Weather condition: Sunny

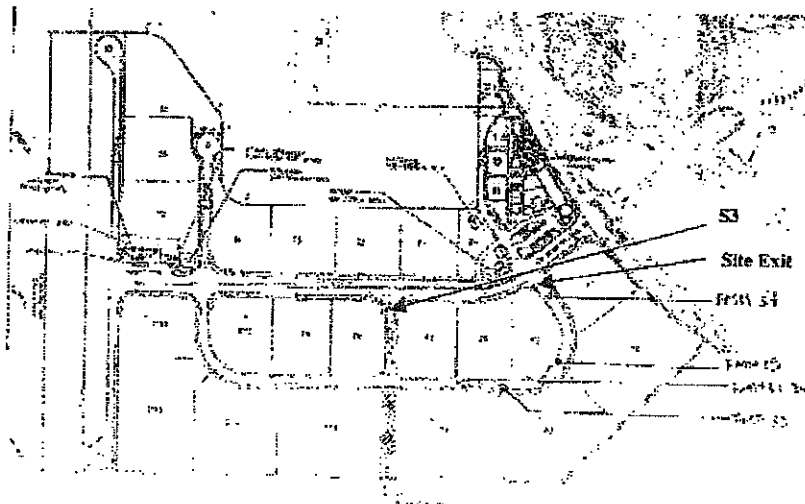
Monitoring performed by: William Law

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	11:26	00.0	00.0	20.2	79.8	29.60
Site exit	11:37	00.0	00.0	19.7	80.3	29.57



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: 17/7/2009

Weather condition: Sunny

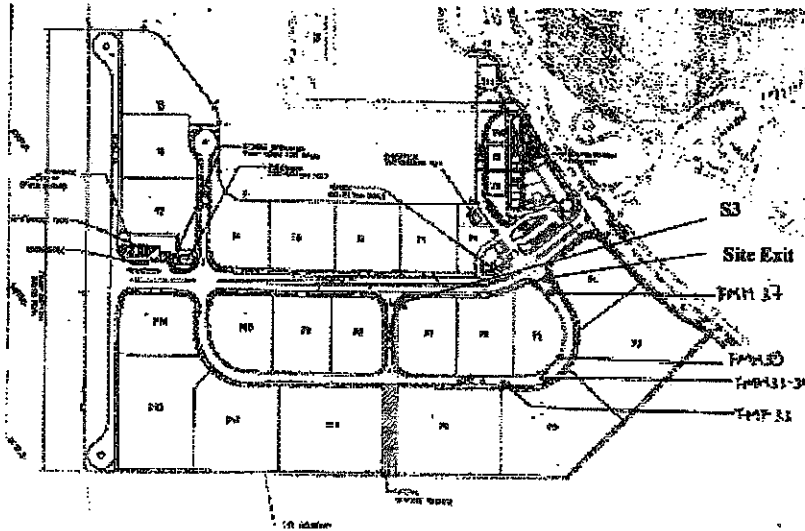
Monitoring performed by: William Law

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	11:04	00.0	00.0	20.3	79.7	29.60
Site exit	11:20	00.0	00.0	19.7	80.3	29.57



Environmental Pioneers and Solutions Limited

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Landfill Gas Monitoring – Field Measurement Recording Sheet

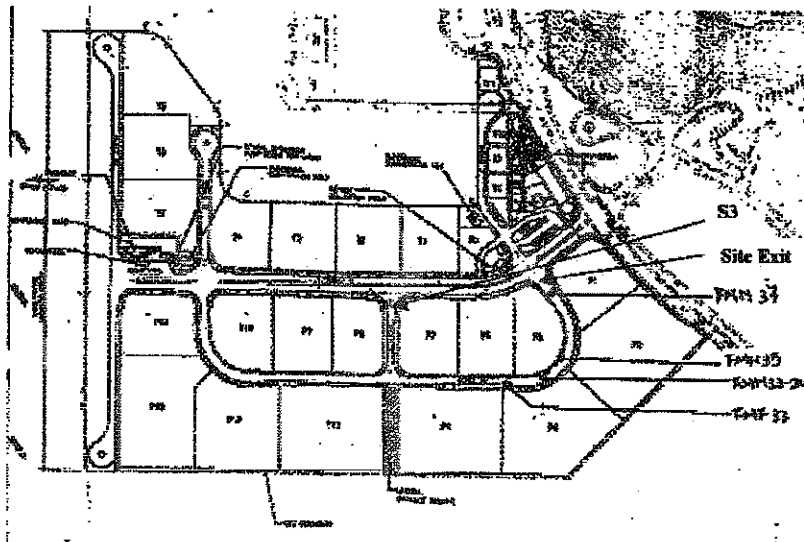
Date of Monitoring: 24/8/2009
 Weather condition: CLOUDY (OVERCAST)
 Monitoring performed by: WILLIAM LAM

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	11:34	00.0	00.0	19.9	80.1	29.57
Site exit	11:16	00.0	00.0	20.4	79.6	29.58



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: 31/7/2009

Weather condition: SUNNY

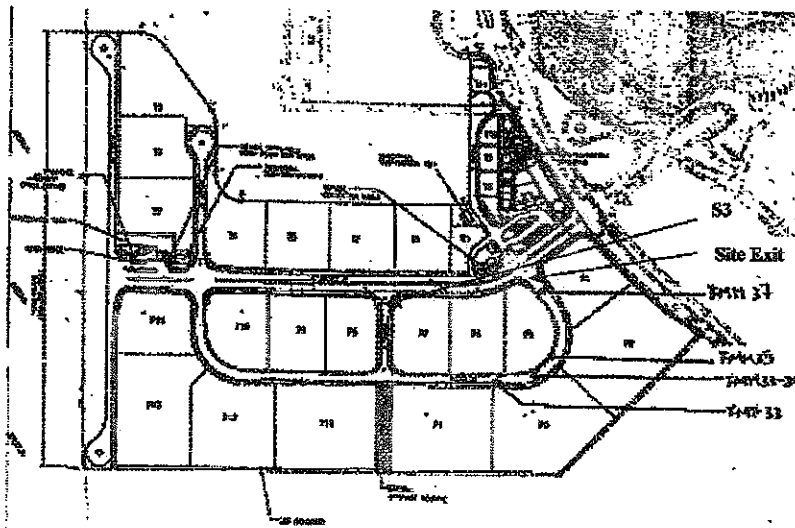
Monitoring performed by: William Law

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	11:00	00.0	00.0	19.9	80.1	29.60
Site exit	11:00	00.0	00.0	20.4	79.6	29.60



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

Environmental Parameters	No. of Outstanding Complaints	No. of complaints received in July 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
-	-	-	-	-	-	-



